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(54) **ACELLULAR VASCULAR PRODUCTS**

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(58) **Field of Classification Search**

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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,776,853 A 10/1988 Klement et al.
8,735,054 B1* 5/2014 Sun 435/1.1

2004/0208842 A1* 10/2004 Ritchie A61K 8/41
424/70.21

2005/0266390 A1* 12/2005 Ueda A61F 2/062
435/1.1

2008/0306610 A1* 12/2008 Wang A61K 35/32
623/23.72

2013/0028981 A1* 1/2013 Gratzer A61L 27/3641
424/548

FOREIGN PATENT DOCUMENTS

CN 101184775 5/2008

CN 101474426 7/2009

CN 101573148 11/2009

GB 2375771 A 11/2002

GB 2443938 A 5/2008

WO WO 02/096476 A1 12/2002

WO WO 2004/003178 A2 1/2004

OTHER PUBLICATIONS

Brockbank, Kelvin et al. Tissue Preservation. Advances in biopreservation. Jun. 15, 2006. pp. 157-195.*

Brockbank (Tissue Preservation, 2006).*

International Search Report corresponding to PCT/GB2011/051817 mailed Mar. 20, 2012.

Written Opinion of the International Preliminary Examining Authority corresponding to PCT/GB2011/051817 mailed Mar. 20, 2012.

International Preliminary Report on Patentability and Written Opinion Corresponding to International Application No. PCT/GB2011/051817 ; Date of Mailing: Apr. 11, 2013; 10 Pages.

* cited by examiner

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(57) **ABSTRACT**

A product comprising a natural acellular xenogenic vascular tissue matrix having at least an 80% reduction in DNA content as compared to an untreated control vascular tissue matrix and being antigenically inert by being substantially free of epitopes capable of reacting with pre-formed human antibodies and also without having the ability to substantially activate complement. The invention also includes methods of preparing such products and uses of the products especially in bypass surgery.

12 Claims, 11 Drawing Sheets